

Technical training.
Product information.

F12 Displays, Indicators and Controls



BMW Service

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General information

Symbols used

The following symbol is used in this document to facilitate better comprehension or to draw attention to very important information:



Contains important safety information and information that needs to be observed strictly in order to guarantee the smooth operation of the system.

Information status and national-market versions

BMW Group vehicles meet the requirements of the highest safety and quality standards. Changes in requirements for environmental protection, customer benefits and design render necessary continuous development of systems and components. Consequently, there may be discrepancies between the contents of this document and the vehicles available in the training course.

This document basically relates to the European version of left hand drive vehicles. Some operating elements or components are arranged differently in right-hand drive vehicles than shown in the graphics in this document. Further differences may arise as the result of the equipment specification in specific markets or countries.

Additional sources of information

Further information on the individual topics can be found in the following:

- Owner's Handbook
- Integrated Service Technical Application.

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The information contained in this document forms an integral part of the technical training of the BMW Group and is intended for the trainer and participants in the seminar. Refer to the latest relevant information systems of the BMW Group for any changes/additions to the technical data.

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F12 Displays, Indicators and Controls

1. System overview

1.1. Introduction

As with all other BMW models, the operating concept of the new BMW 6-Series convertible is based on a clear and optimized layout of the instruments and controls. The number of switches has been reduced in order to simplify logical operation. The display and operating elements are organized in a hierarchical arrangement corresponding to their function.



F12 Overview of display and operating elements

Index	Explanation
1	Head-Up Display (HUD)
2	Central information display (CID)
3	Favorite buttons for individual assignment and operation of heating and air conditioning system
4	Controller (CON)
5	Gear selector switch (GWS)
6	Control buttons, steering wheel
7	Operating facility for assist systems (BEFAS)
8	Instrument panel (KOMBI)

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2. System components

2.1. Instrument panel

As with previous BMW models the F12 instrument cluster arranges and displays the speedometer, tachometer, fuel gauge, engine oil temperature, indicators and warning lights clearly .

The instrument cluster (KOMBI) receives information in analog and digital electrical signals via the wiring harness. These signals are processed and then displayed, or passed on as information to other control units.

The F12 cluster is a further development of the F01 instrument cluster and, as a control unit, is a bus component of the MOST bus (Media Oriented System Transport) bus and powertrain CAN (PT-CAN).



F12 Instrument cluster

2.1.1. Brake energy regeneration

The Brake energy regeneration display is faded into the current consumption display in coasting (overrun) mode.

The kinetic energy of the vehicle is converted into electrical energy during coasting. The vehicle battery is partially recharged and the fuel consumption can be reduced.



F12 Fuel economy display in coasting (overrun) mode

2.1.2. On-board computer

As with all BMW vehicles the F12 is equipped as standard with an on-board computer.

The on-board computer functions can be called up by briefly pressing the on-board computer button on the steering column switch.

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Pressing the on-board computer button again displays information in the following order:

- Range
- Average consumption
- Average speed
- Distance (with activated route guidance)
- Arrival time (with activated route guidance)
- Date
- Speed limit information.

The functions to be displayed in the CID can be selected via "Settings" -> "Information Display".



F12 Buttons on steering column switch

Index	Explanation
1	On-board computer button
2	High-beam assistant button
3	Steering column switches

For more detailed information, refer to the current version of the BMW 6-Series convertible Owner's Manual.

2.2. Central information display

The central information display (CID) has been redesigned for the F12.

As with all new BMW models, the system is operated by means of the iDrive system controller.

The central information display is an integrated display and operating facility for the following functions:

- Audio functions, such as radio, CD, MP3 for example
- Telephone and data services
- Navigation

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- On-board computer, journey computer
- Vehicle information, Interactive Owner's Manual (IBA)
- Vehicle settings
- Vehicle functions, for example PDC and EDC
- BMW Services.

2.2.1. CID with 10.25" screen diagonal

A 10.25" diagonal screen CID is installed as standard equipment. The display resolution is 1280 x 480 pixels.



F12 CID with 10.25" screen diagonal

2.3. Head-Up Display

The name "Head-Up" describes the principle benefit of this system. The Head-Up Display (HUD) projects a virtual image into the driver's field of view. Important information, e.g. from the cruise control or navigation system with activated arrow display, is reflected on the windshield and is therefore permanently available in the driver's field of view.

The Head-Up Display is part of the Driver Assistance Package (SA ZDA) in the F12. The HUD contains various functions aimed at enhancing driving safety and ride comfort.

The following information is displayed:

- Vehicle speed
- Set speed regulation by the cruise control with braking function (DCC)
- Navigation system
- Check Control messages
- Speed limit information
- Lane departure warning
- Night Vision with pedestrian detection

The HUD used in the F12 has been enhanced to include the following functions:

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- Intersection view
- Road symbol in the junction view.

The HUD in the F12 can now also project the color blue in addition to red and green. Contents can be displayed in all colors of the RGB color spectrum, as is the case with an LCD monitor, by mixing the three colors.

Having the displays in the driver's direct field of view increases safety, as this allows the driver to keep his eyes on the road at all times.

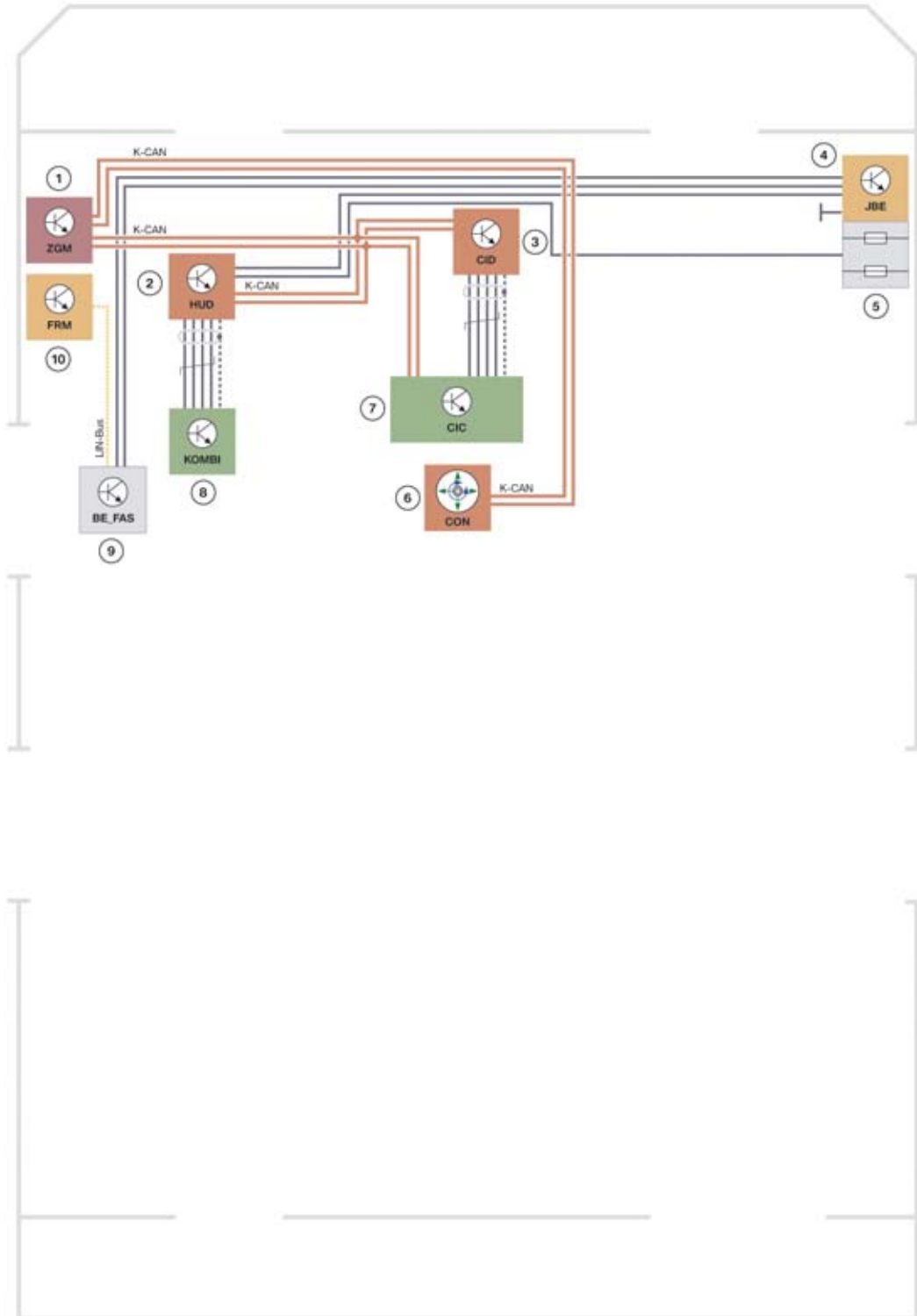


Head-Up Display

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2.3.1. System wiring diagram



TE10-1568

System wiring diagram of Head-Up Display

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2. System components

Index	Explanation
1	Central Gateway Module, (ZGM)
2	Head-Up Display (HUD)
3	Central information display (CID)
4	Junction box (JB)
5	Power distribution box, front
6	Controller
7	Car Information Computer (CIC)
8	Instrument panel (KOMBI)
9	Control panel, driver assist systems (BEFAS)
10	Footwell module (FRM)
K-CAN.	Body controller area network
LIN-Bus	Local Interconnect Network bus

2.3.2. Functional principle

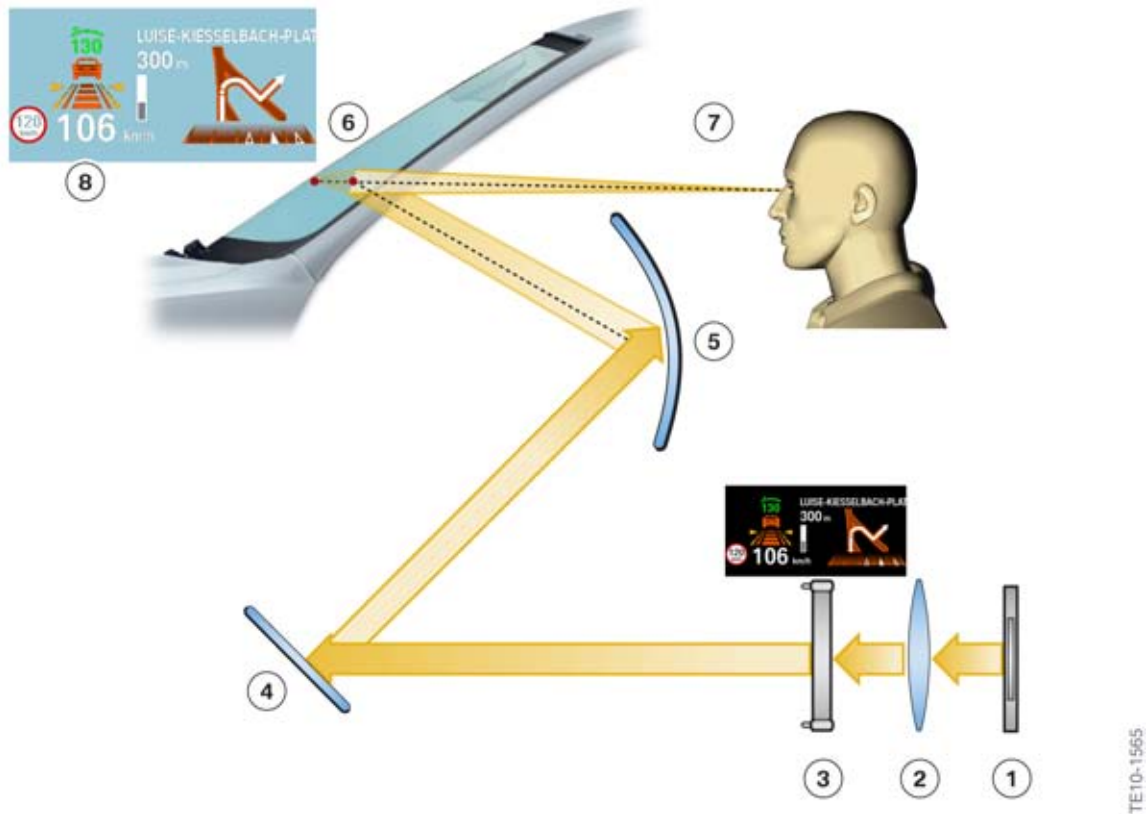
The HUD is similar to a projector. A light source is required to project the HUD information. Two white LEDs serve as the light source. The light is directed through a lens onto a TFT projection display where the screen contents are displayed. The TFT projection display can be compared to a filter which admits or blocks light.

An optical imaging element determines the shape, distance and size of the HUD images.

The image appears to float freely over the roadway, the windshield acts as a deflecting mirror.

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Principle of Head-Up Display

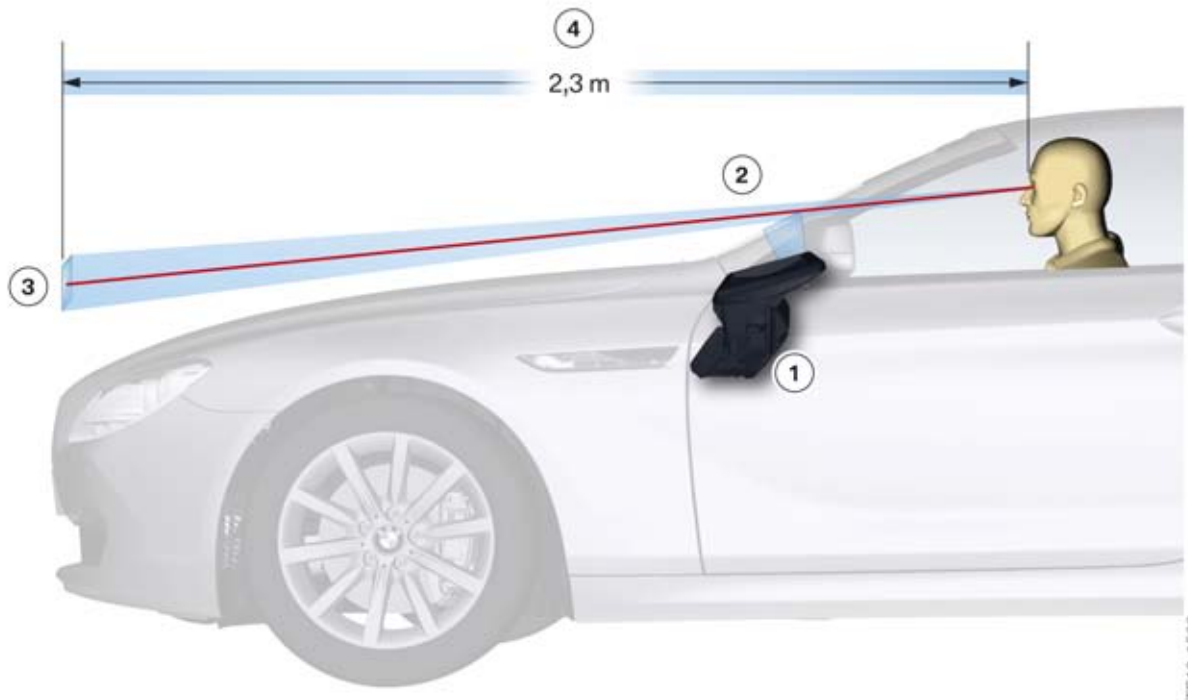
Index	Explanation
1	Light source
2	Lens
3	TFT projection display
4	Plane mirror
5	Curved mirror
6	windshield
7	Observer's point of vision
8	Projected image

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Projection distance

The projected HUD image content appears approximately 2.3 m from the observer's eye.



Projection distance

Index	Explanation
1	Head-Up Display
2	windshield
3	Projected image
4	Projection distance

Indication range

The HUD size is approximately 200 mm x 100 mm with a display resolution of 480 x 240 pixels.



HUD display (example)

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2.3.3. Operating elements and settings

The HUD is operated and adjusted via the following operating elements:

- BEFAS on/off button
- Controller/CID
- Dimmer wheel in light switch cluster.

Switching on/off

The button is resistance coded and is routed directly to the HUD. The resistance coding enables the HUD to identify the button signals or a fault in the button.

Settings

The HUD settings are displayed in the CID and can be modified via the controller:

- Call up the main menu by pressing the menu button
- Call up "Settings" menu item
- Call up "Head-Up Display" menu item.

The following settings can be modified:

- Brightness
- Height adjustment
- Displayed information.

The basic brightness of the Head-Up Display can also be modified via the dimmer wheel in the light switch cluster.

Test functions

Certain test functions may be also invoked directly on the HUD without using a BMW diagnostic system, as follows:

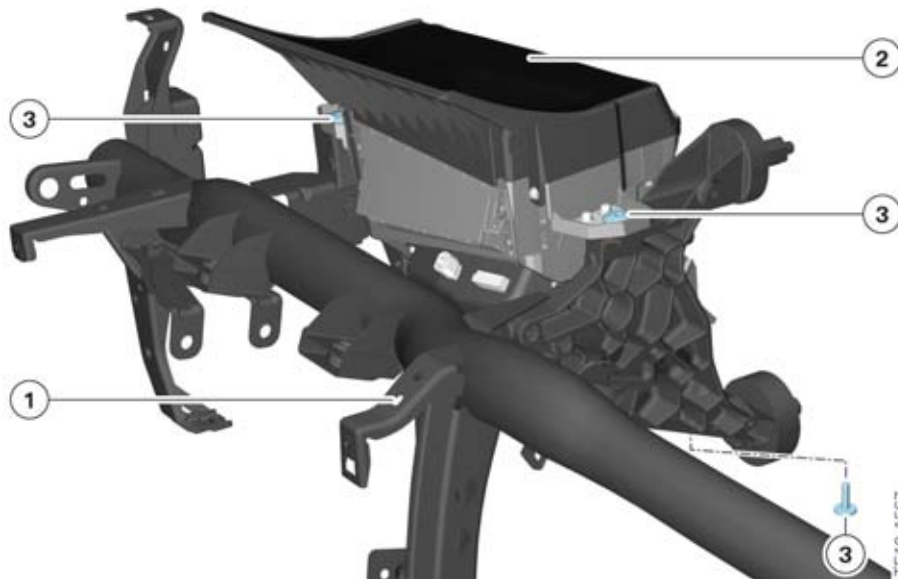
- Hold the HUD button in the BEFAS pressed for roughly 20 seconds and then release
- Press the button again to call up additional test functions
- Hold the HUD button in the BEFAS pressed for longer than 20 seconds to exit this function.

2.3.4. Installation location

The head-up display is fitted above the steering column, immediately behind the instrument cluster. It is secured to the bulkhead supporting structure using three screws.

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F12 Installation location of HUD

Index	Explanation
1	Carrier bracket
2	Head-Up Display (HUD)
3	Screw

2.3.5. Windshield

The windshield is a "special pane of glass" and an important element in the projection of the displays. The outer and inner glass panes are bonded to a plastic film, just like in the standard windshield. Unlike in the standard windshield, this plastic film is not parallel but is tapered over the entire area of the windshield.

Incorrect windshield installed

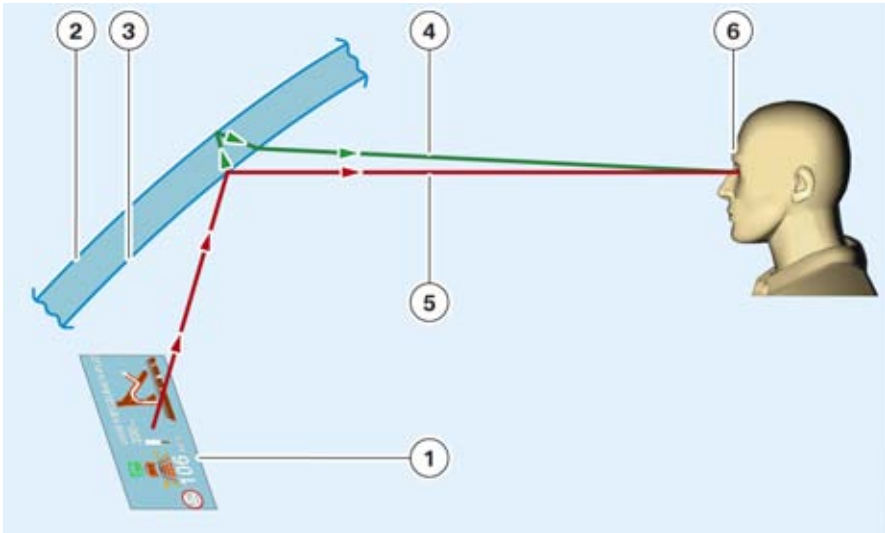
The HUD image is always reflected on the inner surface and outer surface of the windshield.

With a standard windshield, the two reflected images are offset due to the tilt angle of the window glass.

Due to the taper angle, these two images are superimposed on the HUD window glass with the result that the driver only sees "one" image.

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Double reflection

Index	Explanation
1	Display
2	Outer surface of the windshield
3	Inner surface of the windshield
4	Reflection on the outer surface of the windshield
5	Reflection on the inner surface of the windshield
6	Driver's eye

The following illustration shows the result if a standard windshield is installed.



Appearance of HUD with a standard windshield

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2.4. Operating elements on the steering wheel

A switch block is integrated into the steering wheel on the left and right side respectively.

The operating elements for the Cruise control with braking function (Dynamic Cruise Control [DCC]) are on the left side of the steering wheel.

The operating elements for operation of the radio and telephone functions are on the right.



F12 Operating elements on the steering wheel

Index	Explanation
1	Shift paddle, shift down
2	Shift paddle, upshift
3	Rocker switch +, increase volume
4	Rocker switch -, reduce volume
5	Voice input system button
6	Telephone button
7	Knurled wheel, select/set radio station or music track
8	MODE button, change between audio sources
9	Rocker switch \pm , change speed, set speed
10	Switch on/off or interrupt DCC
11	Resume button, call-up stored speed
12	Set speed button

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2. System components

2.5. Operating elements in the center console

The center console of the F12 contains the following operating elements:



F12 Operating elements of the center console

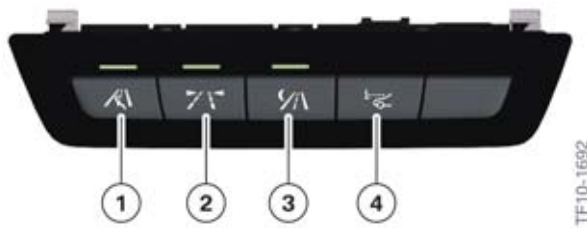
Index	Explanation
1	Gear selector switch
2	Controller
3	Parking brake
4	Automatic Hold
5	Park Distance Control
6	Side View
7	Drive dynamic control switch
8	Dynamic Stability Control

2.6. Operating unit for the driver assistance systems (BEFAS)

The individual driver assistance systems can be activated or deactivated via the driver assistance systems operating unit which is located next to the steering wheel in the left side of the dashboard.

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F12 Operating facility for the driver assistance systems

Index	Explanation
1	Lane change warning
2	Lane departure warning
3	Night Vision with pedestrian detection
4	Head-Up Display

2.7. Service functions

2.7.1. Test functions

The test functions are shown in the TFT display of the instrument panel. The test functions are used by BMW Service to check the encoding. The test functions also provide help in troubleshooting without a BMW diagnosis system.

To start functional check

- Terminal 15 ON
- Press and hold down the reset button in the instrument panel for ten seconds

All the described test functions can also be performed via the BMW diagnosis systems.

Locking and unlocking the test functions (test function 04)

Only the first four test functions are freely accessible. All test functions are locked from the fifth test function onwards. The test functions can be unlocked via test function 04.

The test functions are unlocked by entering the combined total of the last 5 digits vehicle identification number.

Display of test functions

The test functions are faded into the center of the TFT display, between the two round instruments.

The main test functions are listed below. In addition to the majority of test functions, there are further equivalent functions for which a similar display appears in the instrument panel.

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Test function	Description
01	Identification
02	System test
03	Test End
04	Unlock test functions
05	Current consumption
06	Range/consumption
07	Fuel gauge values
08	Coolant temperature, ambient temperature
09	On-board computer average values
10	Speedometer / revolution counter
11	Display of operating voltage
12	Trigger audio signals
13	Read fault codes
14	Dim LCD
15	Dim PWM signal
16	Condition Based Service
17	Check Control
18	Correction factor, consumption figures
19	Software reset / RAM reload

Operation of test functions

The test functions are operated with the assistance of the reset button in the instrument panel.

Press the reset button briefly once to scroll through the test functions. Hold the reset button pressed down for longer to access the selected test function.

Exit test functions

- Terminal 15 OFF
- Hold reset button pressed for longer than ten seconds. The main menu fades into the instrument panel
- Call up test function 03 (end test)
- Call up test function 19 (RESET).



To protect against unauthorized access, all but the first four test functions are locked again when the test functions are exited.

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2.7.2. Resetting the scope of maintenance work

If the service has been carried out for one or more scopes of maintenance work, replacement of front brake pads for example, the full service interval must be reset for these scopes.

When resetting the scopes of maintenance work, a differentiation is made between two types:

- Statutory scopes of maintenance work, such as the technical vehicle inspection , which can only be reset in the "Service" menu.
- All service-related scopes of maintenance work, such as changing the spark plugs for example, are reset via the reset mode in the instrument panel.

Activating reset mode

- Terminal 15 ON
- Press and hold down the reset button in the instrument panel for between five and ten seconds.

Hold the reset button pressed for longer than ten seconds to call up the test functions.

Press the reset button briefly once to scroll through the scopes of maintenance work. Hold the reset button pressed for longer to access the reset menu for the selected scope of maintenance work. Press and hold the button again to reset the scope of maintenance work. It is only possible to reset the scopes of maintenance work once thresholds for specific scopes of maintenance work have been undercut.

Exit reset mode

- Terminal 15 OFF
- Start engine
- Do not press button for 15 seconds.



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